RCEME TECHNICAL BULLETIN

Vol 4 No.2 1 Sep 59

RESTRICTED

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REME - PATRON SAINT

The REME Corps Committee have decided that St. Eligius (known as St. Eloi in France) shall be adopted as the Patron Saint of REME.

Saint Eligius was born about the year 588 at Chaptelat near Limoges. He served his apprenticeship as a goldsmith and subsequently became Master of the Mint in Paris.

Saint Eligius who took a leading part in ecclesiastical life was eventually chosen to be Bishop of Noyon and Tournai. He is the Patron Saint of all kinds of metalworkers. His festival day is December 1.

REME - Corps Motto

Subject only to the approval of the Colonels Commandant, the following will be adopted as the REME Corps Motto:-

"Arte et Marte"

the English translation of which is:-

"By Skill and by Fighting"

The opinion of RCEME officers is solicited as to whether we should follow our affiliated Corps by adopting the above two items.

PLANS AND TRAINING

Standard RCEME Reference Libraries

It is difficult to publish a complete list of standard library books until more RCEME trade specifications have been rewritten and published in the Canadian Army Manual of Trade and Specialties. Bulk orders will be placed by DEME with automatic issue to units requiring books, as the RCEME trade specifications are published and the lists of unit book holdings are reviewed. This will save units indenting separately for this type of publication.

Engineering handbooks and management books will probably be issued on a similar basis as money becomes available.

The academic textbooks which are being issued to units for pre-artificer assessment study will be held as part of the Standard RCEME Reference Libraries.

The amendments mentioned in the article on General Staff Training Publications in the RCEME Technical Bulletin, Vol 4 No 1, 1 Mar 59, have been cancelled. The technical government publications by Canada, United Kingdom, and United States which were to be included as GS Publications will now be included in the planned Standard RCEME Reference Libraries.

WORKSHOP CONTROL PROCEDURES

Another phase of the trials held at 14 Coy RCEME Camp Borden to prove the practicability of the new workshop forms has now been completed. Further studies will continue at this unit.

As a result, a new printing of the "Request for Services" (CAFC 2149) has just been made. In addition EME Manual Static Operations K 010 and K 011 have been combined in a new K 010 (Issue 3) "Workshop Control Procedures". This new instruction shows the use of code numbers to designate the unit and the equipment being serviced, thus permitting this information to be processed onto automatic data processing cards. Other minor changes to permit automatic data processing are prefixed to indicate

(a) Accidents
(b) Engine replacement
(c) Transmission replacement
(d) Civilian contract

As work orders are received at AHQ all the information about the job is coded on a punch card which permits the information to be stored for automatic data processing later. To ensure reliable results from this processing it is essential that the coded information be complete and accurately entered in the proper spaces at source or at workshop level. No additional information must be added in these coded areas and coded blocks not used must be left blank. This is most important.

It is planned that some time in the late autumn Static Ops K 018 and K 019 will be cancelled, and workshop loading reports will be forwarded from AHQ directly to workshops rather than as at present. Command EMEs, Company Commanders, etc, will also receive copies of these workshop loading reports along with comments and trends as they are developing. This is a major step forward.

Studies are also progressing to simplify time accounting procedures and by automatic data processing to eliminate the time accounting return.

A major departure from previous policy with respect to control procedures is that in the new K 010, Section Registers no longer exist. The workshop section has become solely a production unit with the Control Officer and his staff controlling the work in all sections. This gives considerably increased responsibility to Control Officers and in some of the larger workshops may require certain duties to be delegated, such as "signing for".

The Control Officer is solely responsible for every work order processed within his shop and must have intimate knowledge of its progress. To do this he must know each section workload, section backlogs and available production hours. His main tool is an intercommunication master station with out-stations in the various production section plus an adequate up-to-the-minute Control Board, a sketch of which is shown hereunder.

	WHEEL		BODY		PAIN	ELS		TINSMITH	
	CIV	MIL	CIV	MIL	CIV		MIL	CIV	MIL
AVAILABLE MAN HRS									
FIELD BACK LOG									
WORKSHOP BACK LOG									
WORKSHOP BACK ORDER									

With the July printing of the new CAFC 2149s and their distribution by workshops to units, we hope to see the end of RCEME distribution of these forms. A new order has been placed for a one year's supply, and delivery is expected early in November at which time adequate supplies should be available to all concerned.

These forms are to be delivered to 26 COD who will, in turn, supply the RODs, and from then on units will be required to demand their own supplies through normal channels.

The CAFC 2149 (Trial) has now been catalogued as CAFC 2149 (Revised 1959) and the Shop Job Card as CAFC 2267 (Revised 1959).

RCOC non-technical workshops, in the near future, will also use the CAFC 2149s as a request for services and, in addition, LADs and other units will use Shop Job Cards as a method of expending parts and material on the equipments they repair.

The No. 4 copies of CAFC 2149s being received in DEME still have many errors from a unit point of view as well as workshop procedures. OIC workshops must ensure accuracy and completeness of this copy, and where units continue to err must liaise directly with them in this regard.

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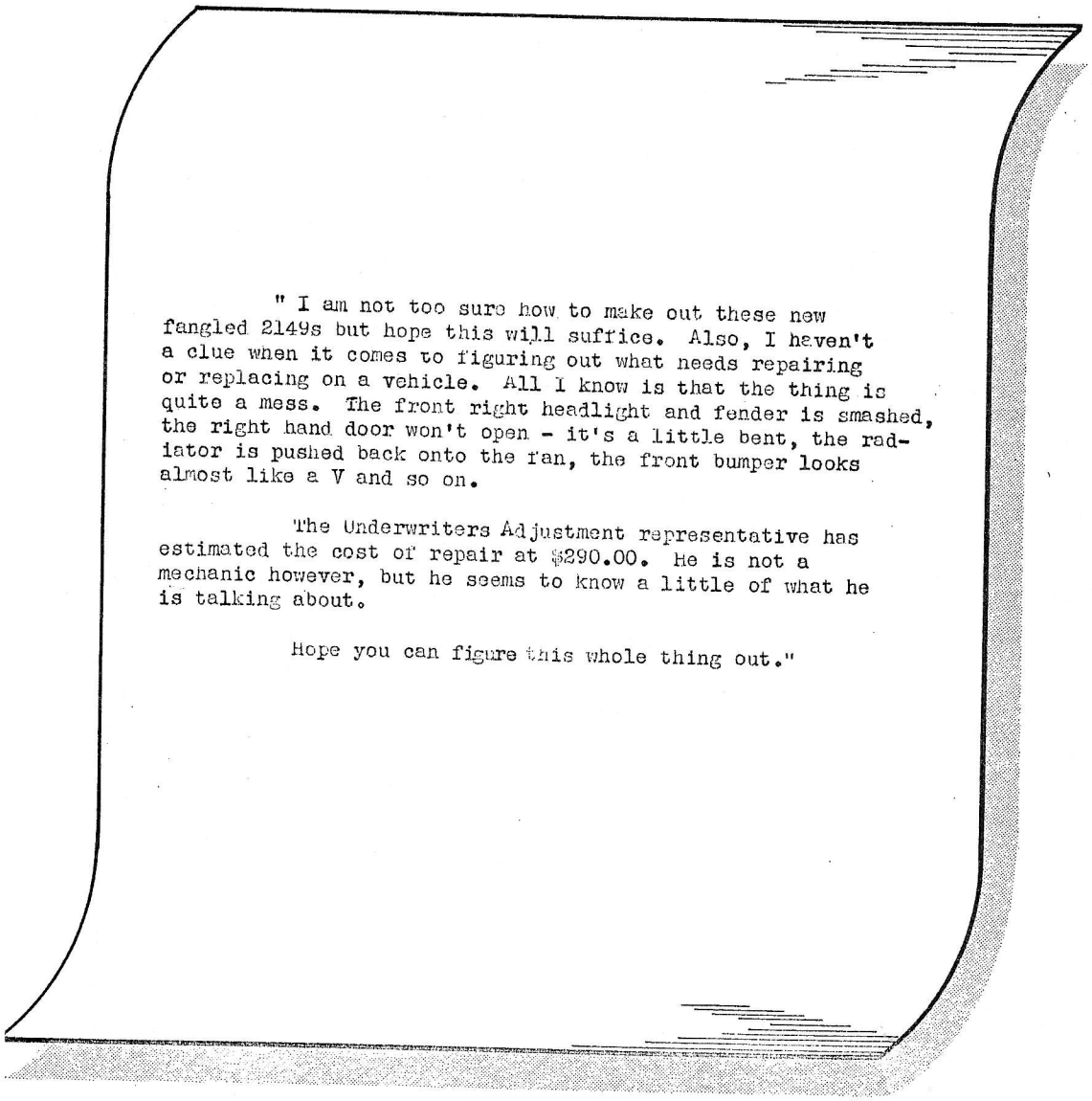
The following note was received from an NCO at a remote unit, which indicates there is humour in the difficulties some individuals have in filling out the forms.



" I am not too sure how to make out these new fangled 2149s but hope this will suffice. Also, I haven't a clue when it comes to figuring out what needs repairing or replacing on a vehicle. All I know is that the thing is quite a mess. The front right headlight and fender is smashed, the right hand door won't open - it's a little bent, the radiator is pushed back onto the fan, the front bumper looks almost like a V and so on.

The Underwriters Adjustment representative has estimated the cost of repair at $290.00. He is not a mechanic however, but he seems to know a little of what he is talking about.

Hope you can figure this whole thing out."

CIVILIAN CONTRACTS

Revised Contract Instructions

The long overdue revision of EME Manual Static Operations L 101 to L 105 has been completed and distribution was made in February and March. Since time does not always allow workshop personnel to make a complete study of the many instructions received, it is perhaps worthwhile to mention briefly the more important of the changes in procedure.

L 101

a. Details of unserviceable non-accountable parts resulting from contractor supply are no longer required on a 'one for one' basis. RCOC will now accept a certification signed by the O i/c that the parts were returned. This is not intended to minimize the importance of receiving the parts but rather to eliminate the former strict accounting for unserviceable material.

b. A standard Contract Control Register has been introduced. No doubt, some of you may feel that your 'local' form was superior to this form. This may well be, since a great deal of effort had been put into some of the local forms. However, it is considered that the form called up in the instruction is simple and sufficient for our needs.

L 102 and L 103

a. Due to the various interpretations of signing authorities that can be taken from CAOs 227-5 and 227-6, the DEME interpretation has been spelled out in both instructions.

b. Since RCOC no longer require a copy of the invoice, this copy will be passed to DEME.

c. A standard "Request for Authority" in excess of local limits and a method of coding wires for such requests has been introduced in L 103.

L 105

a. Much of the narrative used in Issue 2 has been deleted. The information is now shown in five 'step by step' examples, with an 'action and distribution' form of flow chart beside each example.

b. The DEWAO distribution has been changed slightly. DEME will now retain Copy 2 when received from the manufacturer.

c. As a result of b. above, so that DEME may record commitments and hasten outstanding forms, information concerning authorized DEWAOs will be advised weekly with the DEME copies of LPOs and DDP Reqs.

d. The contract details have been moved from the body of the instruction to an annex to allow for a simple method of amending. The Ford pricing basis is changed from "list less 25% to "trade" and a firm pricing basis for sublet work has been established.

So much for the highlights!

Any of you who have worked in DEME will appreciate that, in spite of checking and re-checking, errors are almost unavoidable. Those which could be confusing are mentioned below and it is suggested that 'ink amendments' be made in your copies of the instructions:

L 101

a. Para 24 b: The phrase "a trasportation contract" should read " a transportation contract".

L 103

a. Para 26 Delete all reference to the fifth copy of the invoice.

b. Fig 1 - Block at right of example, seventh from the top The word "requirements" should be "recommendations".

c. Fig 5 - Line 5 The letter "g" should be "q".

Observations - LPOs, DDP Reqs and DEWAOs

For some time DEME has been carefully reviewing all contract forms. Most of the errors are of a minor nature, and rather than take up your time and ours with volumes of correspondence, one 'letter of observation' will be forwarded approximately every six months. We have mentioned in the covering letter concerning the observations, but perhaps it is worth repeating, that the observations are intended as a means of education and are not to be construed as reflections on the ability or integrity of contract personnel. Most of the errors are the result of inadequate or incorrect information provided to the originator of the form which is not too difficult to correct at the workshop level.

EME MANUAL DISTRIBUTION

It will be apparent by now that the EME Manual is being distributed direct to units by DOS (Publications). See EME Manual General A 004 Issue 6.

RCEME units, both Regular and Militia, are getting copies of all instructions in the number requested in a survey made some time ago. This number will be the same 'across the board', allowing DOS to mark the quantity permanently on the mailing label whether it be for Static Ops or for Vehicles. The details of distribution are thus simplified.

As classes and codes are no longer used, when an instruction with unit implications is printed, DEME determines what Corps require the information and all regular units in those Corps receive one copy. Militia units, other than RCEME, receive only data summaries.

It was assumed that some adjustments would have to be made but, although the new method has been in use since the middle of July, there have been only two observations: a Command EME regretted that sometimes units received instructions before he did; and a RCEME company complained they were being short changed one copy.

TECHNICAL SECTION

ARMAMENT

Stripped Lands

Provisional Condemnation Certificates are being received concerning stripped lands in gun barrels. Limits cannot be established for this defect. PCCs should only be submitted when it has been established by test that the failure resulting in decrease in MV and range was not due to ammunition malfunction. Armt F 614 Instr 2 para 6 should be consulted in regard to stripped lands. Armt A 524 is under revision and the information in para 109 will be deleted.

SMALL ARMS

Launcher Rocker A tk, 3.2-in C1

Consideration is being given to the supply of a modification kit for each launcher which would contain the necessary items for satisfactory repair of the majority of failures which have been reported. Detailed instructions will be published when the kits are available.

Rifle Automatic 7.62 mm FN C2

A new design carrying handle has been introduced at serial No. 1LA101 approximately. Instructions will be issued to modify prior-built units when stocks of the new handle are available.

A new and more stable design bipod was introduced at serial No. 0LA101 approximately. Bipods fitted to prior-built units are being replaced with the new design under RCOC arrangements.

Armourers should ensure that only breech blocks fitted with extractor COC No. 1005-21-103-1085 are used with the rifle C2. Breech blocks with either extractor may be used with the rifle C1.

Rifle 7.62 mm FN C1

Instructions will be issued in the near future regarding methods of strengthening handguards and butts to reduce the incidence of splitting.

Armourers should be instructed that whenever possible split butts and handguards will be repaired by patching or gluing.

Modification instructions are now being prepared which will

a. add a .030-in radius to the wings of the protector, foresight;

b. shorten the length of the screw, locking hinge pin, by 0.01-in;

c. introduce either a new lever, locking catch, or a new design thumb piece to prevent accidental opening of the rifle.

INSTRUMENTS

Theodolites Directional C2B1

An Equipment Failure Report has been received on two theodolites directional C2B1 where the cement has failed, allowing the protective glass to separate from the reticle. The cause of this failure has now been determined as a defect in the equipment or as a misuse of the particular instrument. A detailed report on any future failures of this nature would be appreciated.

Cataloguing

With the introduction of the NATO system of cataloguing, new stock numbers and designations have been assigned to several instruments, for example:-

Rangefinder, sight, 9-in CDN EX 2 becomes	Rangefinder, sight, C1
Director C1	Aiming Circle, C1
Clinometer, field, Mk 6	Quadrant, Gunners, Mk 6

With all documents amended to reflect the new designation, there may be confusion in identification of those instruments having the designation engraved on them until personnel are familiar with the change, or a policy is arrived at regarding the re-engraving of the new designation on the instruments.

Instrument Projects

Many of the new instruments require new testing techniques and test equipment. Projects are being conducted by Maintenance Techniques Development Section, Montreal (MTDS) to develop techniques and test equipment for repair of the following instruments:

Aiming circle C1
Mount, telescope, M90
Rangefinder, sight, C1
Sight, bore, 3.2-in launcher, CDN, Mk 1
Setter, fuze M26 and M28
Sight, periscopic, AFV, No. 1, Mk 2, 3, and 4

Pertinent test equipment and EME Manual instructions will be issued on completion of these projects.

ELECTRICAL

Batteries

Research into these primary sources of power is continually going on in an attempt to produce more efficient vehicle and communication batteries.

VEHICLE BATTERIES

Krylastic "J"

This is a very high impact plastic. It is a smooth yellow or blue colour and a standard 12 v SMP vehicle battery (BB248U) made from this material can stand a three foot drop onto solid concrete without damage.

Krylastic "J" has been extensively tested by the Canadian Army; although performance characteristics appear satisfactory, approval has not yet been obtained for the introduction of this battery into the service.

If introduced the number of batteries lost because of mechanical damage will be sharply reduced.

Nickel-Cadmium

The ni-cad battery is being considered for cold weather operations.

Advantages

1. It has a high degree of reliability.
2. Long shelf life.
3. Overcharging has no detrimental effect.
4. Can be stored for very long periods in a wet discharged condition.
5. It will supply cranking current at -40 deg F.
6. It can be recharged at that temperature.

Disadvantages

1. Cost is approx 15 to 20 times that of a lead-acid type.
2. The present vehicle charging system would require modification.
3. The voltage curve is very flat and gives no warning prior to failure.

Because of these factors the ni-cad battery is unlikely to be taken into service within the foreseeable future.

COMMUNICATION BATTERIES

Mercury Cell

This cell is now being used in radiac instruments. Experimental batteries have been produced to power field radio equipment like the AN/PRC 510B.

This battery has a positive electrode which is an intimate mixture of mercuric oxide and carbon in contact with a steel can. The negative electrode is zinc and the electrolyte is an aqueous solution of potassium hydroxide and zinc oxide.

Advantages

1. Very high capacity to volume ratio.

2. High sustained voltage under load.

3. Not adversely affected by high temperature.

Disadvantages

1. Poor cold weather characteristics. This can be improved somewhat by varying the construction of the cell. However for extreme cold weather operation some method of internally or externally heating the battery is required.

Nickle-Cadmium

A Ni-Cad battery has been developed for the AN/PRC 510. This is an example of using a secondary battery in a primary application. These batteries can, of course, be recharged.

They have the excellent cold weather characteristics mentioned before.

Ten ni-cad batteries are undergoing long term user trials. They replace the present BB46 and are the same dimensions as the present lead-acid battery. The cost of these individually produced batteries is $ 1000.00 each. This would of course be reduced considerably if the battery is accepted and put into large-scale production.

VEHICLES

Ferret Engine Cooling System

The following excerpt from a report by Rolls Royce on the B60 engine is published for guidance of all maintenance personnel.

"We have recently had the experience of carrying out a complete strip and rework of some of the above engines from Ferret scout cars which have been in use by an overseas authority and on examination the following conditions were found.

The engines were deficient thermostats and after stripping and examination there was every indication of overheating, eg, two pistons were seized, and both engines had piston rings burned and feathered; the remaining parts of the engines showed signs of heat strain. It is concluded from these findings that the thermostats had been removed by the users of the vehicles, presumably under the impression

that this would give cooler running. This of course would not be the case: the 'by-pass system incorporated into these engines makes the removal of the thermostat have the opposite result.

"Because of the design of the cooling system it is necessary that a thermostat be in the thermostat housing at all times for the following reasons:

a. Removal of the thermostat from the thermostat housing decreases the amount of coolant normally forced through the water rail to the engine block; therefore, hot spots are created in the back cylinders, causing unbalanced temperature, resulting in engine failure.

b. Thermostats are designed to fail in the open position, and when encountered will be retained in the thermostat housing until replaced by a new assembly."

Maintenance of Turbochargers

A few of the latest engineer equipments purchased by the Canadian Army are fitted with turbochargers. This piece of equipment requires careful servicing and adjusting to ensure maximum life. At present it is necessary for unserviceable chargers to be returned to the factory for repair which is a costly and time consuming operation.

While these attachments are not in general use the SAE paper quoted below is recommended for study by all repair and operating personnel.

GOOD MAINTENANCE LEADS TO LONG TURBOCHARGER LIFE

Based on paper by James A Hardy, Schwitzer Corp.

The DOs and DON'TS for service and maintenance of turbochargers can be itemized.

Do:

1. Maintain air cleaners so that high pressure drops never exist.
2. Keep all intake and exhaust manifold connections tight and leak proof.
3. Maintain the engine so that oil pressure to the turbocharger is high and unfaltering.
4. Clean and inspect the turbocharger often enough to prevent excessive dirt accumulation and to catch bearing wear and minor damage before it becomes serious.
5. Be very careful not to let any foreign material get into the intake or exhaust systems.
6. Maintain the engine oil filters to ensure clean oil.

Don't:

1. Overfuel the engine.
2. Operate beyond the safe altitude limit without reducing fuel rate.
3. Put exhaust pipes or mufflers on the engine which will cause high back pressure.
4. Let heated air go into the turbocharger.
5. Use undersized and restricted inlet piping and air cleaners.

If this list is followed, service experience with turbocharged engines should be satisfactory. Some of the questions that arise regarding proper servicing follow.

What Care Should be Taken to Avoid Overfueling the Engine?

The fuel pump must be accurately calibrated so that overfueling cannot occur. In no case should a fuel pump be adjusted without complete instrumentation to check engine load, speed, fuel rate, exhaust temperature, and turbocharger speed.

The problem is that the turbocharged engine normally runs with relatively large amounts of excess air - thus, it can burn more than the rated amount of fuel. As more fuel is burned, the turbocharger runs faster and supplies still more air. Long before enough fuel is supplied to use the air, the engine will be severely overloaded, resulting in either an engine or a turbocharger failure.

What Adjustments Should be Made for Altitude?

Increases in altitude produce effects similar to overfueling. As altitude increases, both exhaust temperature and turbocharger speed increase. If an engine is to be operated at altitude, it must be derated sufficiently (by reducing fuel) to stay within the operating limits of the engine and the turbocharger. A reliable automatic altitude control for the fuel pump would be highly desirable on engines that encounter a wide range of altitudes in normal operation.

How much an engine must be derated for altitude depends upon the characteristics of the particular engine and turbocharger. One engine may be safe to operate up to only 4,000 ft without derating, while another may be safe at 8,000 ft or more. After the limiting altitude is reached, the engine should be derated approximately 2.5 per cent for each additional 1,000 ft.

What About Air Cleaners?

Turbocharged engines require big air cleaners and big intake piping because they use nearly double the amount of air consumed by naturally aspirated engines of the same displacement. Air cleaner and intake restrictions will reduce the air supply to the engine and cause high exhaust temperatures. If dry-type air cleaners are used, special care must be taken to see that they are large enough and serviced often enough to prevent excessive pressure drops. An indicator warning the operator that the pressure drop through the cleaner has become excessive prevents trouble from this source.

What Damage is Caused by Air Leaks?

Air leaks in the piping between the turbocharger compressor and the engine reduce the air supply to the engine. Thus, piping connections and intake manifold gaskets should be inspected for leaks at frequent intervals. The exhaust manifold gaskets and connections should be inspected frequently because any loss of turbocharger speed will produce high exhaust temperatures.

What is the Importance of Oil Pressure to the Turbocharger?

The turbocharger usually depends on the engine lubrication system for its oil supply. It is essential that this oil supply be absolutely reliable - operation without oil pressure for even a few seconds at speeds of 50,000-100,000 rpm will

damage turbocharger bearings. On the other hand, with a continuous supply of clean oil at sufficient pressure, turbocharger bearings will last indefinitely. The pressure must be sufficient to produce the flow necessary to carry heat away. It is easy to tell a turbocharger that has been operated without oil pressure: the shaft will be blue from the heat.

What Causes Oil Pressure Drop?

Excessive bearing wear in the engine, oil pump wear, malfunctioning of the pressure relief valve, plugged or kinked oil lines cause pressure drop. Dirty oil and long time lags in obtaining oil pressure when the engine is started can cause turbocharger bearing wear. To assure long bearing life, a good filter system should be used.

What Cleaning Procedures Should be Followed?

Cleaning is necessary because soot and dirt will accumulate in the compressor to such an extent that some of the air passages are partially blocked. The frequency of cleaning depends on service conditions. It may vary from 200 to several thousands of hours. The time between inspections normally should not exceed 1,000 hr.

The compressor can be cleaned by removing the compressor cover and washing the surfaces of the diffuser and housing with a solvent and a bristle brush. Open compressor wheels will not accumulate a significant amount of dirt and require very little cleaning. Compressor wheels should never be scraped for cleaning. Metal removed by scraping may cause an unbalance problem.

Deposits may accumulate in the turbine as well as the compressor. Long periods of idling or light load operation will cause carbon to accumulate in the turbine housing and nozzles. These deposits will usually burn out after a short period of high load operation. Until they do, however, they may cause the turbine wheel to drag and run slow, so that the engine will smoke due to insufficient air.

On water-cooled units it is sometimes necessary to disassemble the turbocharger to remove the carbon behind the turbine wheel and in the seal bore adjacent to the turbine wheel. Water leaks into the exhaust system can cause yellow or white deposits on the turbine parts. Sometimes aluminum deposits will be found in the turbine - usually from pieces of scored pistons.

What About Bearing Play?

Whenever the turbocharger is cleaned, the bearing play should be checked. Both radial and axial play should be determined accurately with a dial indicator. Excess play will indicate bearing wear. Such wear is usually the result of low oil pressure or excessively dirty oil.

ENGINEERING TECHNICIANS

The Association of Professional Engineers of Ontario, in June 1956, provided for certification of Engineering Technicians. There is now provision for three grades of technician, and a senior grade called "Engineering Technologist". The grading system has been based upon progressive academic qualifications combined with experience under engineering supervision.

Although their certification does not necessarily justify an increase in pay or a promotion, it does provide a measuring stick of the individual's qualifications. If you are being retired in the next year or two, this should be of some importance to you.

If you are a tiffy and interested, further information may be obtained by writing to The Association of Professional Engineers of Ontario, 236 Avenue Rd, Toronto.

We have determined that Ontario, at the present time, unfortunately, is the only province with such a scheme although most of the other provincial associations are working on similar schemes or are interested.

TRANQUILIZED

An expert reports that most accidents occur when people are either in a high or low mental state. He points out that emotions are potent factors and need control.

So, if we nervous, fidgety, irritable, bundles of tension want to stay around a few years, we'd better try to calm down.

Our emotions were designed to make us fight, or run, in the face of danger. In our complicated society you appear anti-social if you haul off and bust someone everytime you'd like to. And, if you run, there's no place to go. Consequently, we get heeby-jeebies trying to figure out which is best to save--our face or our other end.

At least science seems to be trying to come to our aid. The pill rollers claim it may be possible for us to control our pace, control our mood, control our health, control our drinking, and control birth by the type of pills we take. Sort of allows us to arrange our mood to fit the occasion.

Now, if they could just devise a safety pill which everyone could take on getting up each morning --to get them through the day without being mangled--they'd really have something.

Don't worry about the tense, eager beaver types taking over if you play it cool and relaxed. They'll be eliminated from competition by accidents or heart attacks.

Hedge for the future like me. Take your tranquilizer and be your calm, kind, lovable self.

- Robert D Gidel
in "Safe-T-News"

LOCATION OF RCEME OFFICERS

BRIGADIER

JW	Bishop	Comd HQ BC Area

COLONELS

RA	Campbell	DEME
JR	Dunlop	MA Prague
RL	Franklin	Chief Superintendent ADE
CW	Jones	CO 202 Base Wksp
WS	Hunt	MA Belgrade
EC	Mayhew	DDD
KH	McKibbin	Adm HQ 4 CIBG
A	Mendelsohn	UNMOG (India and Pakistan)
RH	Ramsay	Commandant, The RCEME School

LIEUTENANT-COLONELS

VW	Bethel	DEME
DA	Campbell	DEME
GG	Cavaghan	MCCD Vietnam
EW	Coleman	DEME
WM	Dalrymple	204 Base Wksp
CMR	Elmsley	DEME
HW	Hagey	DDD
WG	Hamilton	HQ RCEME Cencom
CG	Kirby	10 Coy
GT	Kirk	HQ RCEME Eascom
AHR	Lewis	HQ RCEME Quecom
AL	MacLean	CASC Kingston
A	Miller	ADE
AO	Monk	Cdn Arsenals Ltd
HGF	Morgan	HQ RCEME Wescom
WJ	Owens	ADE
AM	Reid	DEME
HM	Robinson	DEME
AG	Sangster	DEME
GW	Thompson	Cdn Army Staff SHAPE
KR	Ward	CAS (W)

MAJORS

J	Adams	CAS (W) Detroit
RW	Anderson	1 Coy
RA	Auckland	3 Coy
HC	Banham	RCEME School
W	Beddard	204 Base Wksp
CH	Betts	18 Coy
EP	Bishop	DST
JC	Boughton	DDD
JH	Bourne	202 Base Wksp
WJ	Branston	20 Coy
EM	Brignell	202 Base Wksp
H	Brown	RCEME School
GW	Bruce	7 Coy
DD	Campbell	7 Coy RCEME
DG	Carlyle	2 Fd Wksp
HL	Cohen	6 Coy
EW	Cole	204 Base Wksp

MAJORS (Cont'd)

KF	Collins	DWD
JH	Coombe	DEME
FE	Cooper	UK Exchange Officer, CALE
F	Coultish	D Pers RCEME
KLF	Coupland	RCEME School
BB	Cox	DEME
JC	Currie	HQ RCEME Wescom
JE	Cuzner	11 Coy
FL	Demone	DEME
MA	Dolan	DDD
WA	Down	RCEME School
WE	Ellis	DEME
HHE	Erb	RCEME School
RF	Fendick	CASC
RK	Fulford	DDP
JJ	Garnett	HQ RCEME Eascom
WH	Glover	3 Fd Wksp
H	Goodfellow	HQ RCEME Wescom
RE	Hallam	4 Coy
EJ	Hare	8 Coy
EJO	Harvey	DEME
TR	Heal	CALE
EF	Hendricks	UK Exchange Officer, CALE
RHC	Hodgson	DEME
EC	Ilott	10 Coy
AJ	Jeffery	5 Coy
FG	Johnson	CAS(W)
EG	Jones	DWD
FR	Kaye	16 Coy
HLM	King	ADE
DT	Kennedy	Inspection Services
VD	Kenyon	12 Coy
JS	Kitto	RCEME School
RC	Lane	ADE
EW	Laver	RCEME School
CG	Lawrence	CALE
JL	Loughridge	13 Coy
RL	MacDonald	202 Base Wksp
ALD	MacDonell	7 Coy
JH	MacLean	ADE
AGM	Maitland	6 Coy
RD	Maybee	RCEME School
HE	McLaughlin	DEME
IM	McLaughlin	HQ RCEME Quecom
H	McManus	D Pers RCEME
GP	Miggins	4 CIBG
KL	Murray	10 Coy
JN	Pinder-Moss	ADE
PLW	Platt	HQ RCEME Quecom
HF	Protheroe	1 Fd Wksp
CG	Provan	DQMG (D&D)
CG	Racicot	5 Coy
RC	Rivers	2 Coy
ANP	Roberts	DEME
M	Ruscher	56 Inf Wksp
IC	Scarlett	204 Base Wksp
FJ	Sergi	DDD

MAJORS (Cont'd)

JP	Sherren	HQ CBUME
JL	Sloan	ADE
SG	Tait	202 Base Wksp
AR	Thomsen	204 Base Wksp
DJ	Tidy	ADE
JM	Treleaven	4 Fd Wksp
PA	Tuck	DEME
RW	Vollett	ADE
JW	Whittingham	DEME
EA	Williams	CGS Office
JA	Wilson	4 Fd Wksp

CAPTAINS

LW	Armstrong	2 Coy
BE	Babcock	Cdn Westinghouse Ltd
GE	Ball	1 Coy
P	Bateson	1 Fd Wksp
GN	Brent	DEME
FC	Bridges	DEME
JE	Brown	1 CIBG LAD
PL	Burcombe	202 Base Wksp
GR	Burton	7 Coy
LN	Bydal	RCEME School
JL	Calvert	RCEME School
JNR	Campbell	12 Coy
AB	Cantlon	RCEME School
FR	Carruthers	DEME
FW	Chapman	CASC
HW	Chapman	DEME
JF	Clárabut	4 Fd Wksp
BC	Clerke	RMC of S (UK)
JE	Coates	DEME
WG	Collins	RCEME School
RDL	Connell	2 Cdn Inf Bde LAD
JH	Cooper	3 Fd Wksp
JN	Courtney	General Motors Ltd
EB	Creber	2 Fd Wksp
AM	Croft	3 Fd Wksp
JJE	Cuddihey	1 LAA LAD
DH	Cumming	RCEME School
DH	Curling	ADE
LA	Daviss	1 RCHA LAD
BM	Deibert	4 CIBG LAD
JD	Delaney	14 Coy
FF	Doherty	DEME
AS	Etter	4 RCHA LAD
GL	Evans	10 Coy
HJ	Fleming	202 Base Wksp
DH	Fraser	DEME
DV	Geary	ADE
AM	Gilbert	DEME
SA	Girdler	3 Coy RCEME
GE	Grainger	ADE
DA	Grant	CASC
ADL	Grinham	DEME
WJA	Groom	19 Coy
GM	Hagan	4 Fd Wksp
WJN	Haggins	ADE
JRAC	Hamel	4 Coy

CAPTAINS (Cont'd)

DV	Hampson	1 Fd Wksp
HV	Hann	10 Coy
PEV	Hansen	6 Coy
CB	Hellyer	DDD
RV	Hill	4 Coy
LF	Holland	ADE
HW	House	ADE
AW	Hughes	11 Coy
RG	Humphreys	11 Coy
CA	Hurst	RCEME School
KR	Joslin	DDD
JJ	Kane	3 Coy
KT	Kennah	2 Fd Wksp
JJ	Klinec	RCS of A (AA)
NE	Laviolette	5 Coy
JW	Lelacheur	RCEME School
AL	Leonard	RMC
RW	Libbey	RCEME School
RR	Logan	204 Base Wksp
LH	Love	1 FGH LAD
WF	Lucano	11 Coy
AM	MacDonald	204 Base Wksp
JA	MacDonald	12 Coy
AJ	MacGillivray	1/8 Cdn Hussars LAD
RL	MacIntosh	56 Cdn Inf Wksp
RMG	MacKenzie	16 Coy
RH	MacLeod	RCEME School
E	MacMillan	202 Base Wksp
DM	Maher	3 Coy
JD	McDougall	2 RCHA LAD
JS	McIntyre	DEME
RA	McKay-Keenan	2 Fd Wksp
MD	McKinlay	8 Coy
FJ	McNaughton	10 Coy
WJ	Mildon	ADE
CA	Millar	RMC of S (UK)
JW	Moody	ADE
JF	Moore	DEME
CR	Morgan	202 Base Wksp
DR	Mowbray	CALE
DA	Nicholson	RMC of S (UK)
PB	Nicholson	ADE
PH	North	Ld SH (RC) LAD
WH	Norton	4 Fd Wksp
GL	O'Brien	DDD
JF	O'Connor	3 RCHA LAD
JR	O'Neill	DEME
FA	Ouimet	RCEME School
TW	Oxley	204 Base Wksp
KS	Parton	13 Coy
R	Peters	13 Coy
JR	Peters	10 Coy
TR	Palfrey	13 Coy
HR	Perry	DEME
HCR	Pfeiffer	204 Base Wksp
HA	Popkin	DQOP
CH	Putt	DEME
JR	Raby	RMC
W	Rhodes	ADE

CAPTAINS (Cont'd)

JA	Richards	11 Coy
AT	Roberts	204 Base Wksp
HL	Robinson	RCEME School
MR	Robinson	Quecom I Staff
V	Roddick	RCD LAD
HA	Rosson	18 Coy
LA	Sainsbury	RMC of S (UK)
DA	Saunders	D Pers RCEME
GD	Savage	7 Coy
RB	Screaton	56 Inf Wksp
RN	Shaw	RCD LAD
WR	Shaw	RCEME School
JO	Sheehan	DEME
OD	Smithe	2 Coy
WD	Sneddon	202 Base Wksp
JA	Stott	3 CIB LAD
EJ	Stow	RCS of A (AA)
WG	Svab	ADE
GW	Swallow	DEME
WA	Thomas	RCEME School
JD	Trevithick	RCEME School
WW	Virtue	16 Coy
PG	Vyvyan	3 Coy
HK	Warren	RCEME School
MG	White	CADEE
WR	Willing	CAS (W)
DPW	Wood	204 Base Wksp
GA	Wright	CAS (W)
B	Yarymowich	CASC

LIEUTENANTS

KI	Anderson	3 Fd Wksp
WM	Argue	RCEME School
GF	Bews	ADE
NE	Birchard	HQ RCEME Cencom
JMF	Bourassa	RCEME School
JE	Brewster	14 Coy
FN	Brodie	RCEME School
FJ	Burton	202 Base Wksp
CO	Bush	4 Fd Wksp
LJE	Byer	RCEME School
DM	Campbell	RCEME School
WM	Campbell	RCEME School
G	Charles	HQ RCEME Wescom
TM	Chell	RCEME School
JP	Cloutier	5 Coy
PR	Comeau	RCEME School
EM	Conway	2 Fd Wksp
PR	Dack	RCEME School
R	Coucet	McGill Univ
JP	Durocher	5 Coy
S	Dzuba	13 Coy
CCG	Edgar	10 Coy
OA	Edmond	4 Fd Wksp
HT	Edworthy	RCEME School
EAD	Elliott	202 Base Wksp
RJ	Francis	DEME
GL	Gillespie	RCEME School
FB	Goring	204 Base Wksp

LIEUTENANTS (Cont'd)

RE	Goulding	3 Fd Wksp
NA	Graham	RCEME School
JR	Griffin	1 CIBG LAD
RT	Hare	1/8 Cdn H LAD
HJ	Hellard	RCEME School
FA	Hlohovsky	Ld SH (RC) LAD
O	Howard	RCEME School
WR	Hyman	202 Base Wksp
FG	Hutson	RCEME School
ID	Isbester	3 Coy
AT	Johannes	Univ of BC
MC	Johnston	10 Coy
JR	Kaye	13 Coy
GW	Keays	3 Coy
JE	Kerr	DEME
RA	Kyle	1 Fd Wksp
PR	Lavellee	3 Fd Wksp
EV	MacInnis	7 Coy
RJC	Maillet	11 Coy
GM	Masuda	1 Fd Wksp
DG	McCulloch	Queen's Univ
DG	McKay	7 Coy
HJ	Millen	56 Inf Wksp
RW	Miller	Queen's Univ
TME	Mimee	RCEME School
HG	Morgan	1 FGH LAD
JL	Moyse	HQ RCEME Eascom
TA	Noon	2 Coy
BEM	Nourse	RCEME School
JTA	O'Farrel	RCEME School
HA	Patterson	10 Coy
JE	Peacock	DEME
DB	Perrin	16 Coy
WC	Perry	8 Coy
PP	Pospisil	RCEME School
RH	Purton	DCER
JHP	Richard	2 Fd Wksp
GS	Rippengale	RCEME School
PF	Romyn	204 Base Wksp
WGL	Russell	202 Base Wksp
DJ	Seabrook	16 Coy
WJ	Shearing	14 Coy
RH	Silversides	7 Coy
DR	Springett	RCEME School
EL	Taylor	4 Fd Wksp
RH	Thorn	RCEME School
VCY	Valiquette	4 Coy
DS	Van Dusen	2 Coy
AG	Waters	202 Base Wksp
DS	White	204 Base Wksp
BH	Wright	DEME